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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOSE LUIS FLORES, ANTHONY MARTIN HILL, and
FRANCISCO ADOLFO CANO¹

Appeal 2016-000798
Application 14/103,433
Technology Center 2800

Before PETER F. KRATZ, CHRISTOPHER C. KENNEDY, and
LILAN REN, *Administrative Patent Judges*.

KENNEDY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's decision to reject claims 1–5. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

BACKGROUND

The subject matter on appeal relates to a method of adaptive voltage scaling. *E.g.*, Spec. 2:2–3; Claim 1. Claim 1 is reproduced below from page 12 (Claims Appendix) of the Appeal Brief:

¹ According to the Appellants, the real party in interest is Texas Instruments Incorporated. App. Br. 3.

1. A method of adaptive voltage scaling of circuits on a semiconductor die comprising the steps of:
 - calibrating a performance sensor at a given operating frequency and a plurality of temperature ranges;
 - creating a lookup table containing performance sensor calibration data at the plurality of temperature ranges;
 - driving the circuits at the given operating frequency;
 - measuring die temperature;
 - recalling from the lookup table performance sensor calibration data corresponding to a temperature range applicable to the measured temperature;
 - measuring performance by the performance sensor according to the calibration data recalled from the lookup table; and
 - adjusting a voltage supplied to the die if there is a performance error in the performance measured by the performance sensor.

ANALYSIS

Claims 1–5 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Hansquine (US 2011/0004774 A1, published Jan. 6, 2011) in view of Hildebrand (US 7,983,870 B2, issued July 19, 2011). The Appellants present arguments only for claims 1 and 5. We limit our discussion to those claims. Claims 2–4 depend from claim 1 and will stand or fall with claim 1.

After review of the cited evidence in the appeal record and the opposing positions of the Appellants and the Examiner, we determine that the Appellants have not identified reversible error in the Examiner's rejection. Accordingly, we affirm the rejection for reasons set forth below, in the Final Action, and in the Examiner's Answer. *See generally* Final Act. 2–6; Ans. 2–14.

Claim 1.

The Examiner finds that Hansquine discloses a method of adaptive voltage scaling comprising each step of claim 1 except that “Hansquine does not explicitly disclose” (1) the “calibrating” step, (2) the “creating” step, or (3) the “recalling” step. Ans. 3. The Examiner finds that Hildebrand discloses each of those limitations. *Id.* at 3–4. The Examiner concludes:

[I]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have included creating a lookup table through calibration and calibrating the performance sensor as taught by Hildebrand in the circuit of Hansquine for the purpose of generating a lookup table containing circuit specific values and testing for errors, as implied by Hildebrand and Hansquine, since it would have been a matter of applying a known technique to a known device ready for improvement to yield predictable results.

Id. at 4 (citations omitted).

The Appellants raise various arguments in opposition to the Examiner’s rejection, which we address below:

1. The Appellants argue that the references do not teach the “calibrating” step. App. Br. 5–6. In general, the Appellants focus on portions of Hildebrand that do not expressly mention performance monitoring and assert, without persuasive explanation, that “[a]ny calibration disclosed in these portions of Hildebrand [sic] et al must be of some other structure than performance monitor 109.” *Id.* at 5. The Appellants also focus on Hildebrand at 8:4–13 and argue that, “[r]ather than calibrating performance monitor 109, the cited portion of Hildebrand [sic] et al teaches using performance monitor 109 to determine the safe operating points of integrated circuit 100.” *Id.* at 6.

The Examiner persuasively explains in the Answer that various portions of Hildebrand, including the portions cited by the Appellants, would reasonably have suggested the “calibrating” step to a person of ordinary skill in the art notwithstanding the fact that Hildebrand may not use the exact words recited by claim 1. Ans. 6–10.

Moreover, we note that, in focusing on Hildebrand at 8:4–13, the Appellants fail to address column 8:1–3, which is also relied upon by the Examiner in the Final Action. *See* Final Act. 3. The Examiner reproduces portions of Hildebrand column 8 in the Answer and emphasizes lines 2 and 3, which disclose that “[t]he performance monitor 109 can be configured by the CPU 101 when it executes the calibration code.” Ans. 6–7 (quoting Hildebrand at 7:62–8:13).

In the Reply Brief, the Appellants quote large portions of Hildebrand, including col. 8:2–3, and assert, without persuasive elaboration, that Hildebrand’s process “is calibration of the integrated circuit using the performance monitor, not calibration of the performance monitor.” Reply Br. 2–3.

We are not persuaded of reversible error in the Examiner’s rejection. In particular, the Appellants have not persuasively addressed Hildebrand’s teaching that “[t]he performance monitor 109 can be configured by the CPU 101 when it executes the calibration code.” Hildebrand at 8:2–3. There is no dispute that Hildebrand’s process concerns frequency, temperature, and voltage. *E.g., id.* at Figs. 2, 3 & col. 2:1–6. Hildebrand expressly teaches that “[t]he safe operating range . . . of the system implemented by the integrated circuit 100 can be determined *on the basis of the safe operating range of the performance monitor 109.*” *Id.* at 8:4–7 (emphasis added). The

rejection before us is an obviousness rejection; it is not an anticipation rejection. The Appellants give no persuasive explanation as to why Hildebrand's disclosure of configuring a performance monitor according to a calibration code would not have taught, or at least suggested, calibration of the performance monitor. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–19 (2007) (“[T]he [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”). On the record before us, we are not persuaded of error in the Examiner's determination that the prior art teaches or suggests the calibrating step of claim 1. *See In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (explaining that, even if the examiner had failed to make a prima facie case, the Board would not have erred in framing the issue as one of reversible error because “it has long been the Board's practice to require an applicant to identify the alleged error in the examiner's rejections”).

2. The Appellants argue that the references do not teach the “creating a lookup table” step of claim 1. App. Br. 6–8. The Appellants block quote large portions of the references and assert, with little persuasive elaboration, that the “AVS frequency/voltage level table 50 of Hansquine et al and look up table 106 of Hildebrand et al store different data than the recited look up table of claim 1.” *Id.* at 8.

We are not persuaded by the Appellants' arguments. In particular, we note that the Appellants' own Specification teaches that the lookup table includes “voltage, temperature and operating frequency values.” Spec. 6:25–26. The lookup tables that the Examiner identifies in the prior

art appear to include the same data. *E.g.*, Hildebrand Fig. 2 (depicting lookup table including “Frequency setting” data and “Voltage level” data at a plurality of temperature ranges ΔT_n).

To the extent that the Appellants’ assert that the lookup tables of the prior art include calibration data of a chip or other device, rather than a performance sensor, we are not persuaded. As noted above, on this record, the Appellants have not shown reversible error in the Examiner’s determination that Hildebrand teaches calibration of a performance sensor. Hildebrand also teaches that “[t]he safe operating range . . . of the system implemented by the integrated circuit 100 can be determined *on the basis of the safe operating range of the performance monitor 109.*” Hildebrand at 8:4–7 (emphasis added). Even to the extent Hildebrand does not expressly teach a lookup table containing performance sensor calibration data, the Appellants have not persuasively shown that Hildebrand does not reasonably suggest that to a person of ordinary skill given that Hildebrand expressly teaches using performance monitor 109 to assess integrated circuit 100 and using “predetermined correlation values which reflect the link between the . . . performance monitor 109 and . . . the (rest of the) system.” *Id.* at 8:4–13. In view of the Appellants’ limited explanation, we are not persuaded that the combination of Hansquine and Hildebrand would not reasonably have suggested to a person of ordinary skill the claimed “creating a lookup table” step of claim 1. *See KSR*, 550 U.S. at 418–19.

3. The Appellants argue that the prior art does not teach the “adjusting” step of claim 1. App. Br. 8–9. However, as the Examiner explains in the Answer, the Appellants’ arguments concerning that limitation are not persuasive because they do not address the Examiner’s rationale. *See*

Ans. 11–12. In the Reply Brief, the Appellants raise new arguments concerning the “adjusting” limitation. *See* Reply Br. 4. We decline to consider those arguments because the Appellants have not attempted to establish good cause for failing to present those arguments in the opening Appeal Brief. *See* 37 C.F.R. § 41.41(b)(2).

* * *

On this record, we are not persuaded of reversible error in the Examiner’s rejection of claim 1.

Claim 5.

Claim 5 depends from claim 1 and further recites “periodically adjusting the voltage supplied to the die based upon changes in output of the calibrated performance sensor.”

The Examiner determines that claim 5 would have been obvious in view of the combined teachings of Hansquine and Hildebrand. Ans. 5.

The Appellants’ argue that neither reference expressly teaches the recited limitation. *See* App. Br. 10–11.

Those arguments are not persuasive. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (“[O]ne cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references.”). In particular, the Appellants have not shown reversible error in the Examiner’s conclusion that claim 5 would have been obvious in view of the references as a whole, particularly Hildebrand’s suggestion that correlations between the performance monitor and the integrated circuit 100 can be used to maintain safe operating conditions for the integrated circuit. *See, e.g.*, Hildebrand 8:1–13, 12:40–13:67.

On this record, we affirm the Examiner’s rejection of claim 5.

CONCLUSION

We AFFIRM the Examiner's rejections of claims 1–5.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED